A 3273-8

Vol. 61 No. 10 October 1986

JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

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Factors Affecting Residents' Decisions To Moonlight

Gloria J. Bazzoli, Ph.D., and Steven D. Culler, Ph.D.

Abstract—Moonlighting by residents has been a major concern of residency program administrators, since extensive moonlighting by residents in addition to their already demanding residency work schedule might jeopardize patient care. In this paper, the authors examine the influence of several factors on residents' decisions to moonlight. The results indicate that the main motivating factor behind their moonlighting is economic and that residents moonlight more frequently when they have the opportunity to do so. In addition, the residents with higher levels of medical school indebtedness were significantly more likely to moonlight than residents with less indebtedness. Personal characteristics of the residents and their specialties also influenced moonlighting but had a smaller impact than amounts of stipends and indebtedness and the number of off-duty hours. The results also suggest that residency administrators can influence their residents' decisions to moonlight.

Although residents work long hours to fulfill their residency requirements, many choose to moonlight during their off-duty hours. Moonlighting by residents has been an area of concern to many residency administrators, as evidenced by an article in the *New England Journal of Medicine* by Moss (1) and by the letters to the editors that this article evoked. Moss identified two health policy questions that arise from the controversy over residents' moonlighting: (*a*) To what extent does moonlighting affect the ability of residents to provide safe, effective care in the residency and in the second job? (*b*) What factors influence a resident's decision to take a second job?

In the present paper, the authors address the second question by examining the influence of several factors on the residents' decisions to moonlight. The data used came from a 1979 survey that collected information on personal and family background characteristics of residents, characteristics of residency programs, time spent moonlighting by each resident, and income received from a moonlighting job. The analysis of these data provides evidence on the prevalence of moonlighting by residents and on the characteristics of residents who were most likely to moonlight.

In addition, the present study sheds light on a major debate in the literature about the primary motivating factor for moonlighting by residents. Moss (1) con-

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tended that economic hardship was the main force causing residents to moonlight. Gould (2), on the other hand, presented an alternative view, suggesting that residents moonlighted simply to gain nonnecessary, supplementary spending money. Moss argued correctly that the debate was "purely speculative and derived from conviction rather than from data." Although it is difficult to distinguish between a need for extra income for necessary expenses and a desire for nonnecessary discretionary spending money, the present study provides evidence that helps resolve this dispute over the primary motivation for residents' moonlighting.

Method

Data used in this analysis came from the 1979 Survey of Resident Physicians conducted by the American Medical Association (AMA) (3). The survey was designed to collect socioeconomic data from a representative sample of residents in all years of training. Questionnaires were mailed to approximately 10,000 residents in the spring of 1979, and completed surveys were returned by 3,403 (35 percent). This response rate is low but is good for resident physicians given their heavy work schedules and their frequent changes of address. The respondents were more often in earlier years of training and more often in residencies in general or family medicine or in internal medicine when compared with those who did not respond. These differences did not bias the results reported here, however, since residents are distinguished by training year and program specialty.

Of the residents who responded to the survey, nearly one-third held a second job during a typical week in 1979. Thus, moonlighting was fairly common, but the moonlighters in 1979 did not comprise the "silent majority" implied by the title of the Moss (1) article. In addition, the moonlighters in 1979 tended to work a substantial number of hours a week in their second jobs, an average of about 11 hours. The moonlighters received a mean wage of $19.74 per hour from their second jobs. In addition, the moonlighters had accumulated significantly more medical school debt on average than nonmoonlighters: $9,500 as compared with $7,800. The moonlighters in 1979 also had slightly lower average stipends ($15,000) than those who did not moonlight ($15,600). Finally, the mean number of hours of work in the residency was 60 hours per week for moonlighters as compared with 71 hours for nonmoonlighters. Clearly, high levels of debt, more off-duty time, and low resident stipends created incentives for the residents to moonlight.

The AMA survey provided data on a number of other factors likely to influence a resident's decision to moonlight. In particular, data on spouse's salary (if the resident was married) and on a resident's nonearned income were collected. The present authors assumed that low spouse salary and low nonearned income were likely to encourage residents to moonlight. Other factors assessed by the AMA survey that might affect the decision were: the resident's sex, age, family size, year of residency, graduation from a foreign versus U.S. medical school, and residency specialty. In all, 2,627 residents gave complete data on their moonlighting and on the factors that might have influenced their decision to moonlight, and these residents were the focus of the present study.

Given the multiplicity of factors that can influence decisions to moonlight, the authors conducted a multivariate analysis of the AMA survey data in 1985 (4). The authors sought in this 1985 study to estimate how the probability that an individ-

ual resident would moonlight was influenced by several factors, namely the amount of a resident's stipends, educational debt, potential moonlighting wages, and spouse's salary (if married); the resident's sex, age, family size, year of residency, specialty, and number of off-duty hours; and whether or not the resident was a foreign medical graduate. The multivariate analysis technique used in that study to measure the effect of each of these factors on the probability of moonlighting was an extension of ordinary least-squares regression analysis. An extension of this basic estimation procedure was necessary because the probability of moonlighting could only take values between zero and one and the ordinary least-squares regression does not take this restriction into account. With this extended estimation technique, the authors were able to measure the effect that each factor had on the probability of moonlighting while holding the effects of the other factors constant.

This 1985 multivariate analysis indicated that all the factors had a significant effect ($p = .05$) on the probability that a resident would moonlight. Therefore, the authors undertook a second analysis to estimate the probabilities that residents with different sets of socioeconomic and demographic characteristics would moonlight. In order to calculate these probabilities, the authors performed a comparative static analysis using the results of the multivariate analysis (4) and the original AMA survey data (3). This second analysis—the results of which are reported here—was specifically designed to allow the comparison of individuals with one set of characteristics with individuals with other sets of characteristics and to calculate the effect of changes in these characteristics on the probabilities being studied.

Results and Discussion

Table 1 shows data on the probability of moonlighting for different levels of medical school indebtedness, resident stipend, and hours of work in the residency program, and Table 2 gives probability data for different specialties and personal background characteristics of the residents. Analysis of the data indicated that the estimated probabilities of moonlighting varied to a large extent depending on the resident's year of residency. The probabilities given in the tables, therefore, were reported by residency year in order to display the large and significant differences by residency year.

Analysis for the present study also indicated that the three factors examined in Table 1 had a larger impact on residents' decisions to moonlight than those factors listed in Table 2. The first factor listed in Table 1 is medical school indebtedness. Each column shows the effect of indebtedness within a given year of residency for a given level of debt. All other factors that affect the decision to moonlight were held constant for the computation of the probabilities by level of indebtedness. Thus, only medical school indebtedness and year of residency were allowed to vary in this particular analysis. The data indicate that higher medical school indebtedness significantly increased the probability that a resident would moonlight. For example, nearly one in three first-year residents with $30,000 of medical school debt moonlighted while only one in five residents with no medical school debt did so. In addition, the probability of moonlighting for a fourth-year resident with medical school debt of $30,000 was 1.4 times larger than the probability for a fourth-year resident with no debt. One reason medical school debt affected the likelihood that a resident would moon-

TABLE 1

Probabilities of Moonlighting for 2,627 Residents Who Responded to a Survey of Residents by the American Medical Association for the Factors of Level of Medical School Indebtedness, Amount of Resident Stipend, and Number of Hours Worked in Residency, by Year of Residency Training, 1979

Factors	Residency Year			
	1	2	3	4 or more
Medical school indebtness*				
No debt	.212	.235	.261	.288
$ 5,000	.229	.254	.280	.304
$13,000	.257	.282	.310	.333
$20,000	.282	.310	.333	.366
$30,000	.322	.350	.378	.409
Resident stipend†				
$10,000	.376	.407	.436	.468
$13,600	.285	.312	.339	.368
$16,000	.213	.235	.261	.288
$21,000	.137	.157	.174	.198
Hours of work in residency‡				
45	.375	.404	.434	.465
50	.323	.350	.383	.408
65	.251	.278	.303	.332
85	.170	.192	.214	.236

* For each level of debt, the probabilities of moonlighting are significantly different ($p > .05$) across residency years. In addition, for each year, the probabilities are significantly different across the levels of debt indicated.

† For each level of resident stipend, the probabilities of moonlighting are significantly different across residency years. In addition, the probabilities are significantly different across stipend levels within each residency year.

‡ For each level of hours of work, the probabilities of moonlighting are significantly different across residency years. In addition, the probabilities are significantly different across hour levels within each residency year.

light is that residents typically must begin loan repayments in their third or fourth year of the residency (5).

Repayment of debt during the residency has an additional implication for a resident's probability of moonlighting over time. For instance, based on the data in this study, if a physician entered a residency with $20,000 of medical school debt but reduced this obligation to $13,000 by the fourth year of training, the probability that this physician would moonlight would be only 33.3 percent as compared with 36.6 percent if there had been no reduction of medical school debt.

The remaining two factors listed in Table 1 are of special importance since they can be directly influenced by residency directors. The residents with larger stipends, regardless of their year in training, had significantly lower probabilities of having a second job than residents with smaller stipends, when all other factors were held constant. The probability of moonlighting for a first-year resident earning a $10,000 stipend in 1979 was 37.6 percent compared with 13.7 percent for a similar resident earning a $21,000 stipend. Increasing a resident's stipend from $10,000 to $21,000 in 1979 reduced the probability that the resident would moonlight by more than one-half for each year of residency.

The second factor influenced by resi-

TABLE 2

Probabilities of Moonlighting for 2,627 Residents Who Responded to a Survey of Residents by the American Medical Association for the Factors of the Residents' Specialty and Characteristics, by Year of Residency Training, 1979

Factors	Residency Year			
	1	2	3	4 or more
Specialty*				
General or family practice	.203	.227	.251	.302
Internal medicine	.154	.174	.192	.239
Surgery	.174	.195	.218	.264
Pediatrics	.233	.258	.281	.337
Obstetrics-gynecology	.258	.284	.312	.367
Radiology	.268	.295	.323	.378
Psychiatry	.092	.106	.121	.154
Anesthesiology	.397	.425	.456	.512
Pathology	.104	.119	.136	.171
Other	.271	.298	.326	.382
Characteristics†				
Female	.159	.179	.201	.245
Male	.258	.284	.309	.370
U.S. medical graduate	.226	.251	.274	.330
Foreign medical graduate	.341	.371	.401	.460

* For each specialty, the probabilities of moonlighting are significantly different across residency years. In addition, probabilities of moonlighting are significantly different across specialties within each residency year.

† For each characteristic, the probabilities of moonlighting are significantly different across residency years.

dency directors is the hours of work in the residency program. Increasing the number of hours a resident is required to work significantly reduces the probability of moonlighting, according to results of the present study. Among fourth-year residents working only 45 hours per week, almost one in two moonlighted compared with less than one in four for fourth-year residents working 85 hours per week, when all other factors were held constant. If the hours of work required in a residency program decline as a resident progresses through the residency, then the more senior residents would have more time that they could spend on outside jobs. In addition, institutions may relax restrictions on moonlighting for residents in later training years, and this relaxation also adds to their ability to moonlight as they advance.

The likelihood that residents moonlight also depends on their specialty (Table 2). Regardless of residency year, the residents in anesthesiology, radiology, obstetrics-gynecology, and other specialties moonlighted significantly more often than residents in general or family practice, internal medicine, surgery, pediatrics, psychiatry, or pathology. Of those who moonlighted more frequently, one in four first-year residents in obstetrics-gynecology moonlighted, and up to one in two fourth-year residents in anesthesiology moonlighted. The range of probabilities for those less likely to moonlight was less than one in 10 for first-year psychiatry residents and almost one in four for fourth-year residents in internal medicine. It may be difficult for residents in the specialties that have fewer moonlighters to find jobs outside the residency, especially those in psychiatry. Emergency rooms which are the most prevalent em-

ployers of moonlighting residents, most frequently receive patients with physical or physiological emergencies rather than patients with psychiatric problems.

In each year of residency, the male residents were over 1.5 times more likely to moonlight than female residents, a statistically significant difference (Table 2). Female residents did, however, moonlight more frequently as they moved into later years of training: 1.5 in 10 first-year female residents moonlight compared with almost 2.5 in 10 female residents with four or more years of residency.

Finally, graduates of foreign medical schools were much more likely to moonlight than U.S. medical school graduates. First-year U.S. medical school graduates had a 22.6 percent probability of moonlighting as compared with a 34.1 percent probability for first-year foreign-trained residents. In fact, the probability that a first-year foreign medical graduate would moonlight was slightly greater than the probability that the most senior residents (4 or more years) from a U.S. medical school would moonlight.

Conclusions

The results of the study reported here provide useful insights into the factors influencing a resident's decision to moonlight. Medical school indebtedness played an important role in the decision to moonlight, especially in later residency years when repayments of some federal loans must begin. Residents with small stipends and residents with fewer hours spent in their residency programs were more likely to moonlight. A resident's specialty and background also influenced the decisions but played a less important role in these decisions than stipend, off-duty hours, and medical school indebtedness.

The overall results of the study lend some support to the claim by Moss (1) that the main motivating factor behind moonlighting is economic. The strong impacts of the levels of indebtedness and stipend indicate that residents who have particularly poor financial situations are very likely to moonlight. However, it is difficult to distinguish a true need from a mere desire for additional, discretionary income. Thus, more detailed data are needed to support the conclusion that the primary motivation for moonlighting is economic hardship.

The results reported here suggest that residency administrators have a substantial opportunity to influence residents' decisions to moonlight. For example, the residents were found to be highly affected by the amount of their stipends and the number of hours spent in the residency. Thus, the authors believe that administrators could decrease moonlighting by increasing the stipends and work requirements of the residencies.

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